AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (Currently Amended) A visualization system for augmented reality, the visualization system for developing a three-dimensional representation of a space system, the visualization system comprising:

~~a processor or~~ a tangible medium comprising:

a positioning portion configured to determine a position of a viewer with respect to a real world and a position of the viewer with respect to a virtual world, the positioning portion configured to allow the viewer to interact with the virtual world;

a modeling portion configured to specify the virtual world in response to a space system model of the virtual world, the space system model including models for the earth and satellites;

a model specification portion configured to specify a representation of satellite model status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to satellite model status data of the satellites; ~~and~~

an output portion configured to provide a three-dimensional representation of a space system, the three-dimensional representation of the space system including an image of the virtual world super-imposed on an image of the real world, the image of the virtual world including the representation of the satellite model status data of the satellites to the viewer in response to the position of the viewer with respect to the virtual world, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites; and

an input portion configured to allow the viewer to select one of the satellites to view satellite model status data of the selected one of the satellites and configured to allow the viewer to direct the selected one of the satellites to move to a different position,

wherein the representation of the satellite model status data of the satellites further comprises a representation selected from the group: satellite sensor orientation, satellite sensor position, and satellite system design data.

2. (Previously Presented) The visualization system of claim 1 further comprising:

an image acquisition source configured to capture at least an image comprising an image of the real world, and an image of at least a pre-determined marker positioned in the real world,

wherein the positioning portion comprises:

an image processing portion configured to determine the position of the viewer with respect to the real world in response to the image of the pre-determined marker; and

a virtual positioning portion configured to translate the position of the viewer in the real world to the position of the viewer in the virtual world.

3. (Previously Presented) The visualization system of claim 1 wherein a model of the virtual world is a multi-dimensional model of the virtual world, and the output portion is a multi-dimensional output portion.

4. (Previously Presented) The visualization system of claim 1 wherein the representation of the satellite model status data further comprises a representation selected from the group: a current position of a satellite, a past position of a satellite, a future position of a satellite, an orientation of a satellite, a trajectory of a satellite, ground coverage of a satellite, a satellite's orientation vectors to other satellites or objects, a satellite's coverage analysis when the satellite is in a view of a region, satellite revisit time, a satellite communication link or network, beam strength of space, and satellite systems status.

5. (Previously Presented) The visualization system of claim 1 further comprising a heads-up pair of glasses.

6. (Previously Presented) The visualization system of claim 1 wherein the visualization system is configured to allow more than one user to interact with the image of the virtual world at the same time and is configured to allow the more than one user to collaborate with each other while viewing from different positions.

7. (Previously Presented) The visualization system of claim 5 wherein the heads-up pair of glasses are also configured to allow the viewer to view the image of the virtual world super-imposed on the image of the real world.

8. (Currently Amended) A method for visualization of augmented reality to develop a three-dimensional representation of a space system, the method comprising:

determining a position of a viewer with respect to a real world and a position of the viewer with respect to a virtual world;

determining a space system model of the virtual world, the space system model including models for the earth and satellites;

determining a representation of satellite model status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to satellite model status data of the satellites;

displaying to the viewer a three-dimensional representation of a space system, the three-dimensional representation of the space system including a representation of the virtual world super-imposed on a representation of the real world, the representation of the virtual world including the representation of the satellite model status data of the satellites in response to the position of the viewer with respect to the virtual world, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites;

selecting one of the satellites, by the viewer, to view satellite model status data of the selected one of the satellites; and

directing the selected one of the satellites, by the viewer, to move to a different position,

wherein the representation of the satellite model status data of the satellites further comprises a representation selected from the group: satellite sensor orientation, satellite sensor position, and satellite system design data.

9. (Previously Presented) The method of claim 8 wherein the step of determining the position of the viewer comprises:

capturing of at least one pre-determined marker positioned in the real world;

determining a position and orientation of the viewer with respect to the real world in response to the image of the pre-determined marker; and

determining the position of the viewer with respect to the virtual world in response to determining the position and orientation of the viewer with respect to the real world.

10. (Previously Presented) The method of claim 8 wherein a model of the virtual world is a multi-dimensional model of the virtual world, and the representation of the virtual world is a multi-dimensional representation of the virtual world.

11. (Currently Amended) The method of claim 8 wherein the representation of the satellite model status data further comprises a representation selected from the group: ~~a current position of a satellite, a past position of a satellite, a future position of a satellite, an orientation of a satellite, a trajectory of a satellite, ground coverage of a satellite, a satellite's orientation vectors to other satellites or objects, a satellite's coverage analysis when the satellite is in a view of a region,~~ satellite revisit time, ~~a satellite communication link or network,~~ beam strength of space, and beam strength of land based laser devices ~~satellite systems status~~.

12. (Previously Presented) The method of claim 8 wherein the step of displaying comprises displaying the representation of the real world and the representation of the virtual world to the viewer with a pair of heads-up glasses.

13. (Previously Presented) The method of claim 9 wherein the step of capturing the image of the pre-determined marker uses a video camera, and the video camera is disposed upon the pair of head-up glasses.

14. (Previously Presented) The method of claim 8 wherein the viewer views the representation of the real world at the same time as the representation of the virtual world.

15. (Currently Amended) A method for visualization of augmented reality ~~method~~, the method for developing a three-dimensional representation of a space system, the method comprising:

determining a space system model of a virtual world, the space system model including models for the earth and satellites;

determining a representation of satellite model status data of the satellites in response to satellite model status data of the satellites, and in response to a position of a viewer with respect to the virtual world;

determining a representation of the virtual world in response to the space system model of the virtual world and in response to a position of the viewer with respect to the virtual world;

displaying to the viewer a three-dimensional representation of a space system, the three-dimensional representation of the space system including a representation of a real world overlaid with the representation of the virtual world, the representation of the virtual world including the representation of the satellite model status data of the satellites, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits, the representation of the virtual world including a three-dimensional representation of the models for the earth and the satellites;

selecting one of the satellites, by the viewer, to view satellite model status data of the selected one of the satellites; and

directing the selected one of the satellites, by the viewer, to move to a different position,

wherein the viewer is allowed to interact with the virtual world.

16. (Previously Presented) The visualization method of claim 15 wherein the position of the viewer with respect to the virtual world is determined in response to an image of a pre-determined marker positioned in the real world taken from a vantage point of the viewer and in response to a correspondence between the virtual world and the real world.

17. (Previously Presented) The visualization method of claim 15 wherein the representation of the satellite model status data of the satellites comprises a representation selected from the group: a current position of a satellite, a past position of a satellite, a future position of a satellite, an orientation of a satellite, ground coverage of a satellite, a trajectory of a satellite, satellite sensor orientation, satellite sensor position, a satellite's orientation vectors to other satellites or objects, a satellite's coverage analysis when the satellite is in a view of a region, satellite revisit time, a satellite communication link or network, beam strength of space, satellite systems status, and satellite system design data.

18. (Previously Presented) The visualization method of claim 15 wherein the representation of the virtual world and the representation of the real world are provided to the viewer with a pair of heads-up display glasses.

19. (Previously Presented) The visualization method of claim 15 further comprising displaying to the viewer a portion of the virtual world selected by the viewer,

wherein the viewer selection is determined in response to a position of a viewer-controlled marker with respect to the virtual world, wherein the marker is positioned in the real world.

20. (Previously Presented) The visualization method of claim 19 wherein the step of displaying to the viewer the portion of the virtual world selected by the viewer comprises overlaying an icon over the portion of the virtual world displayed to the viewer.

21. (Previously Presented) The visualization system of claim 1 wherein the image of the real world and the image of the virtual world are provided in real-time.

22. (Previously Presented) The method of claim 8 wherein the step of displaying comprises displaying to the viewer in real time the representation of the real world and the representation of the virtual world.

23. (Previously Presented) The visualization method of claim 15 wherein the step of displaying comprises displaying to the viewer in real time the representation of the real world overlaid with the representation of the virtual world.

24. (Previously Presented) The visualization system of claim 1 wherein the viewer is allowed to perform one or more of the following: selecting a satellite, selecting an orbit, selecting a geographic area, or zooming-in or out of the virtual world.

25. (Previously Presented) The visualization system of claim 1 wherein the viewer is allowed to directly select and manipulate objects in the virtual world without using a mouse.

26. (Previously Presented) The visualization system of claim 1 wherein the positioning portion comprises a marker positioned in the real world, the marker is static or is placed upon a paddle that includes a pre-defined visual marker in the real world, and the paddle is capable of being moved around the real world.

27. (Currently Amended) A visualization system for augmented reality, the visualization system for developing a three-dimensional representation of a space system, the visualization system comprising:

a processor ~~or a tangible medium~~ for executing instructions, the instructions comprising:

~~a positioning portion configured to~~ determininge a position of a viewer with respect a real world and a position of the viewer with respect to a virtual world~~, the positioning portion configured to allow the viewer to interact with the virtual world~~;

~~a modeling portion configured to~~ specifying the virtual world in response to a space system model of the virtual world, the space system model including models for the earth and satellites;

~~a model specification portion configured to~~ specifying a representation of satellite model status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to satellite model status data of the satellites;

~~an output portion configured to~~ providinge a three-dimensional representation of a space system, the three-dimensional representation of the space system including an image of the virtual world super-imposed on an image of the real world, the image of the virtual world including the representation of the satellite model status data of the satellites to

the viewer in response to the position of the viewer with respect to the virtual world, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites; and

~~an input portion configured to~~ allowing the viewer to select one of the satellites to view satellite model status data of the selected one of the satellites and ~~configured to~~ allowing the viewer to direct the selected one of the satellites to move to a different position.

28. (Previously Presented) The visualization system of claim 27 wherein the representation of the satellite model status data of the satellites comprises a representation selected from the group: a current position of a satellite, a past position of a satellite, a future position of a satellite, an orientation of a satellite, ground coverage of a satellite, a trajectory of a satellite, satellite sensor orientation, satellite sensor position, a satellite's orientation vectors to other satellites or objects, a satellite's coverage analysis when the satellite is in a view of a region, satellite revisit time, a satellite communication link or network, beam strength of space, missile threat clouds, beam strength of land based laser devices, satellite systems status, and satellite system design data.

29. (Currently Amended) The visualization system of claim 1 wherein the tangible medium comprises a medium or media selected from the group: ~~floppy disks,~~ removable hard disks, optical storage media, CD-ROMs, bar codes, semiconductor memories, read-only-memories (ROMS), battery-backed volatile memories, networked storage devices, memory storage devices, random-access-memories (RAMS), and disk drives.